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B7B BTN B367

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(54) Abstract Title: **Trolley with castor swivel locks**

(57) A castor swivel lock 20 and a castored trolley 10 is described. In one form, an automatic release means releases the swivel lock 20 when the trolley (10) is in a predetermined non-operative condition. The predetermined non-operative condition may be coupling by nesting or stacking of one trolley with another trolley, or stowage of a movable carrier shelf of the trolley 10. The swivel lock 20 may comprise a slidable plunger 30 supported above a latch surface 28 carried by a castor 16. The plunger 30 may be biased towards the latch surface 28. The latch surface 28 may comprise ramp surfaces 52 on either side of a latch keep aperture 50.

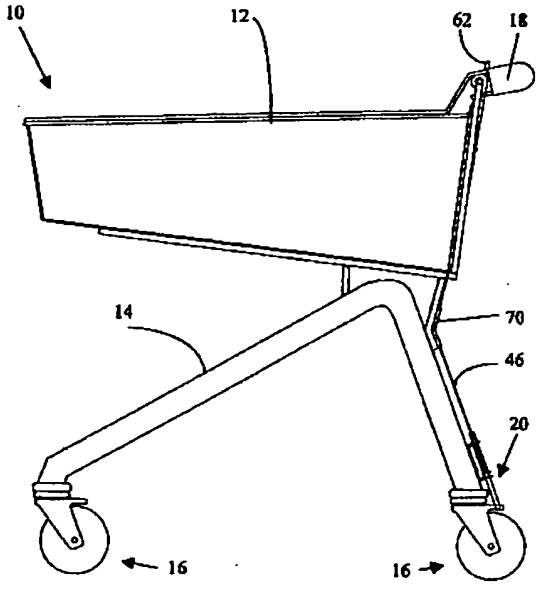

FIG. 1

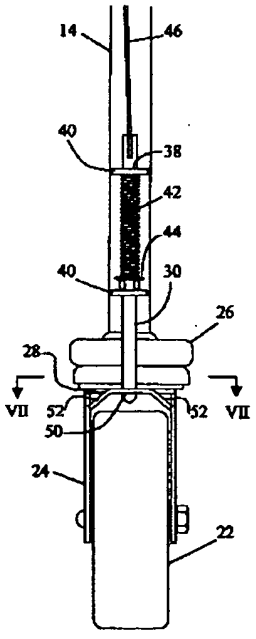

FIG.6

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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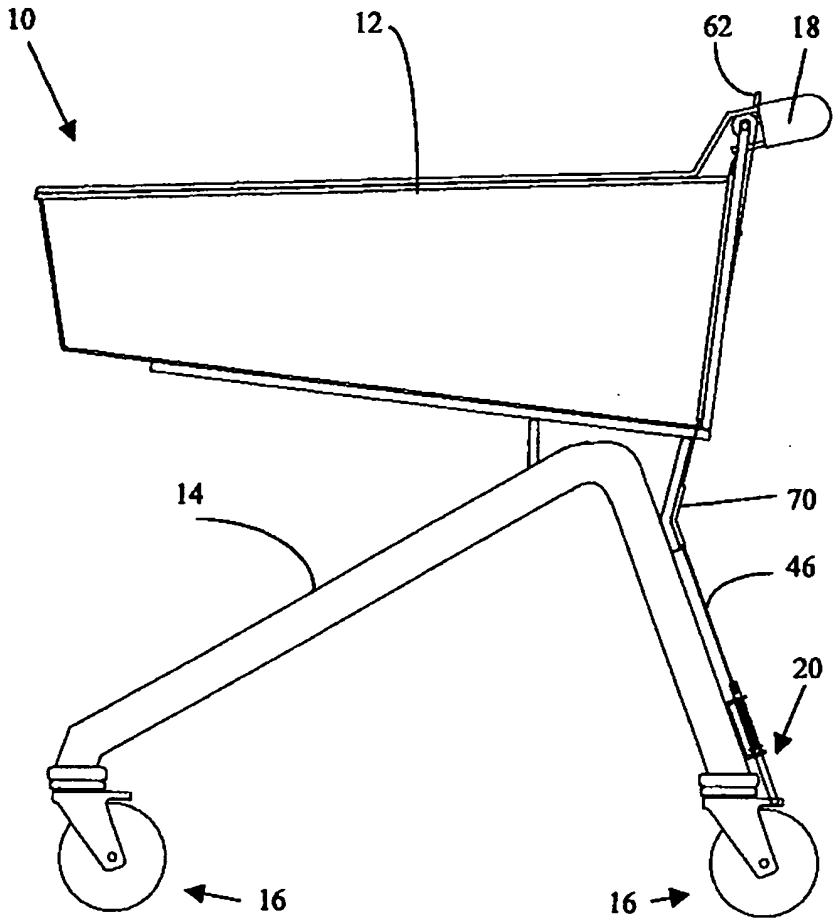


FIG. 1

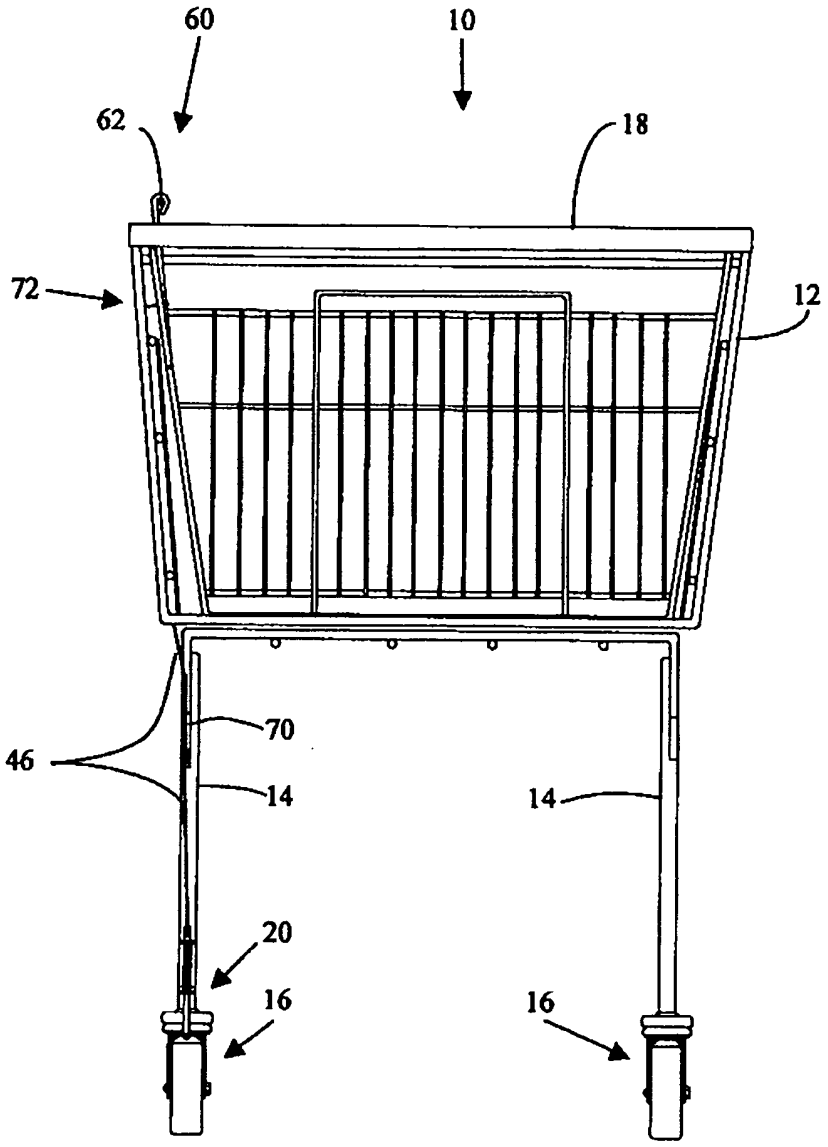


FIG. 2

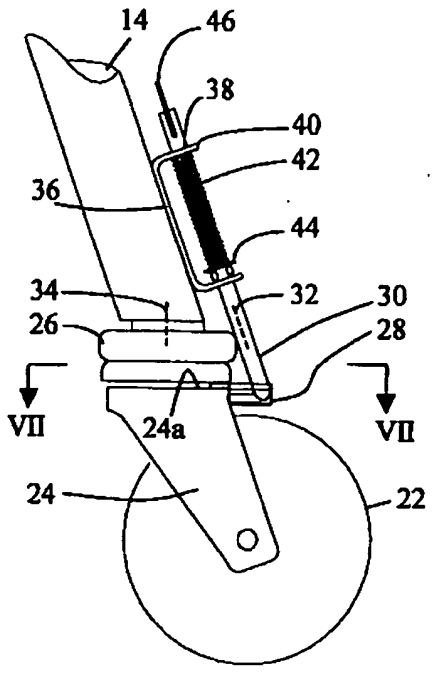


FIG. 3

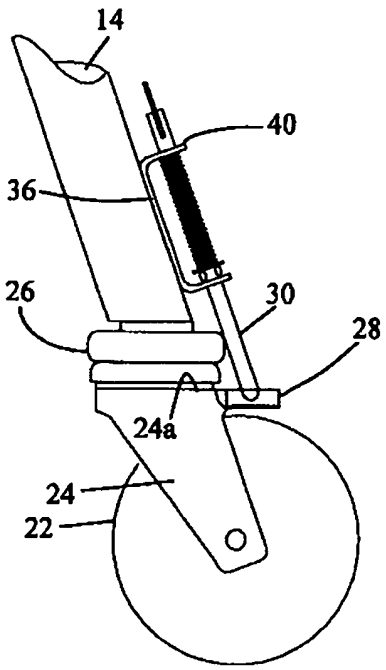


FIG. 4

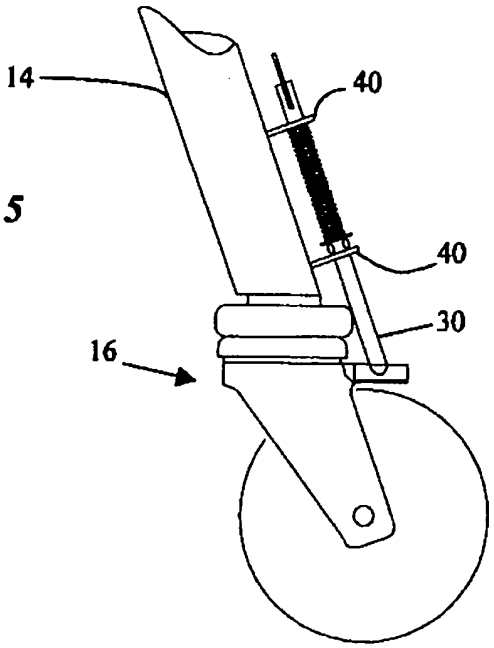


FIG. 5

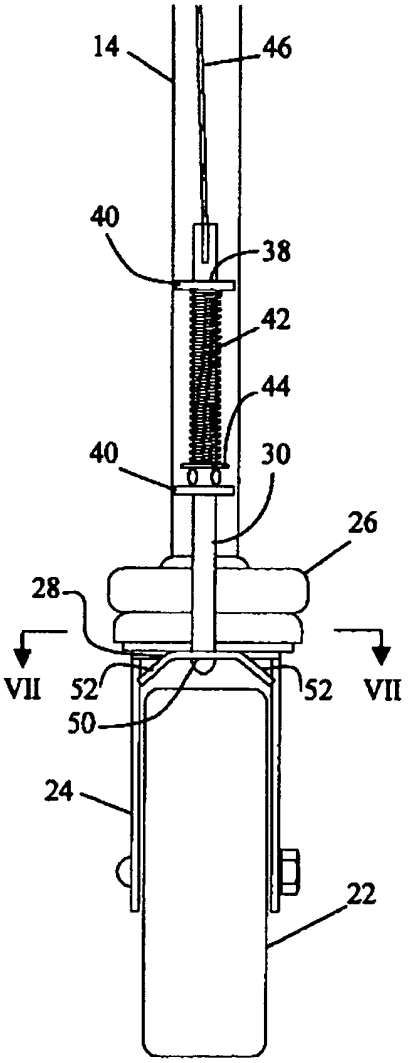
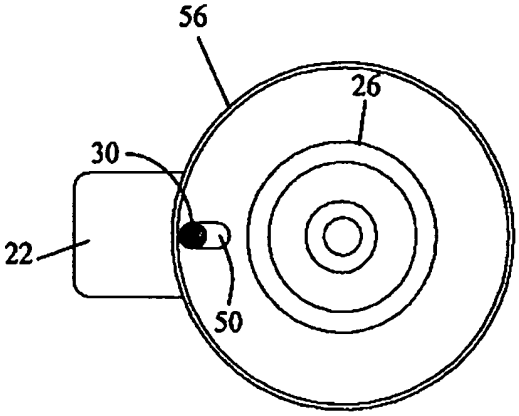


FIG.6

FIG. 8



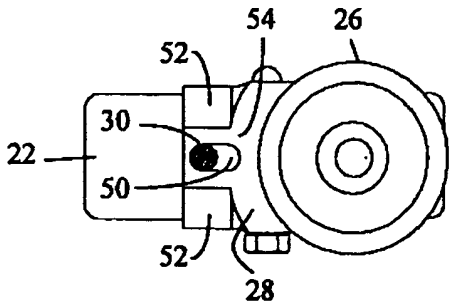


FIG. 7

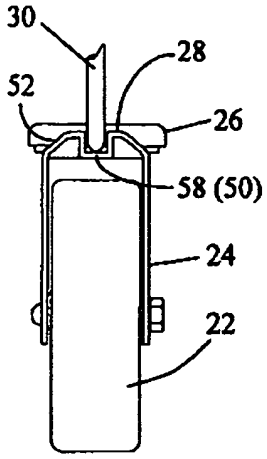


FIG. 9

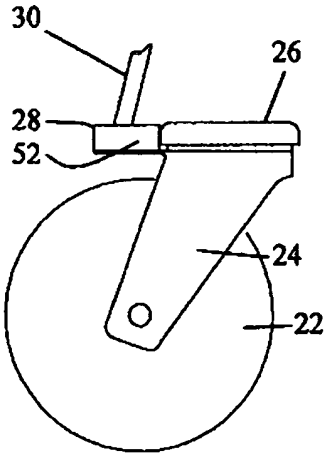


FIG. 10

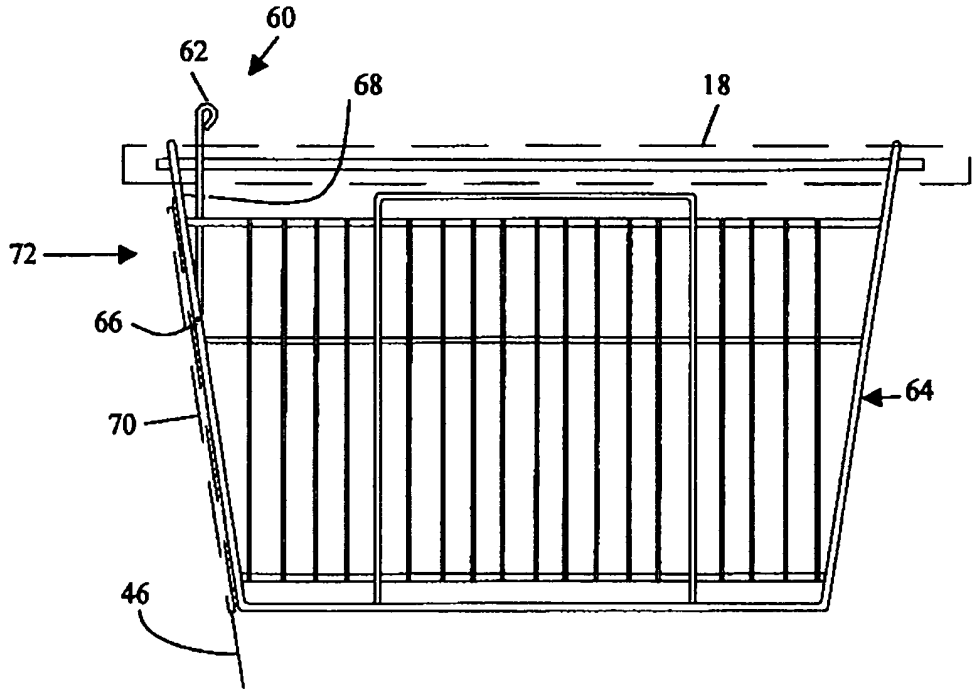


FIG. 11

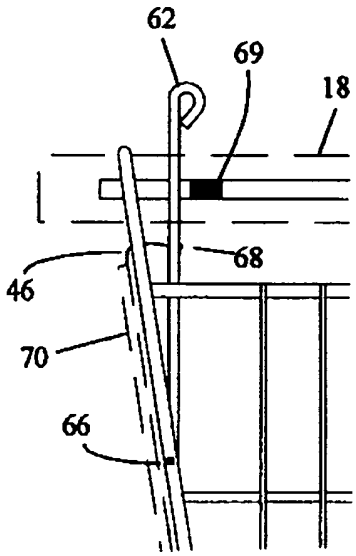


FIG. 12

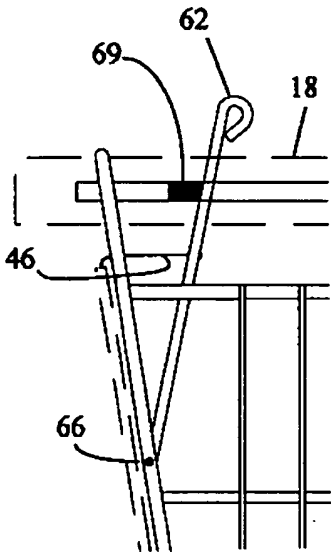


FIG. 13

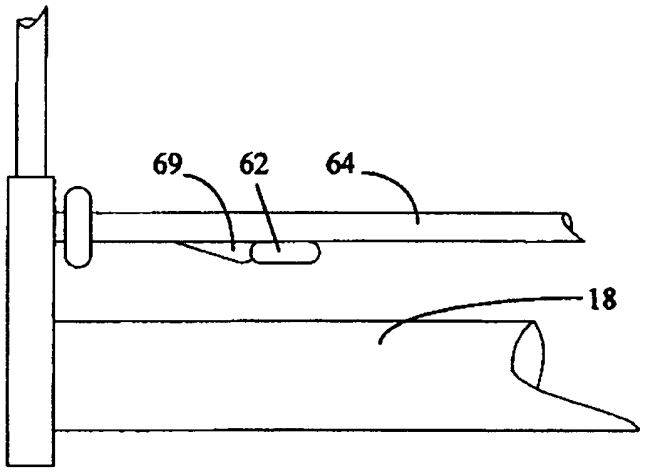


FIG. 14

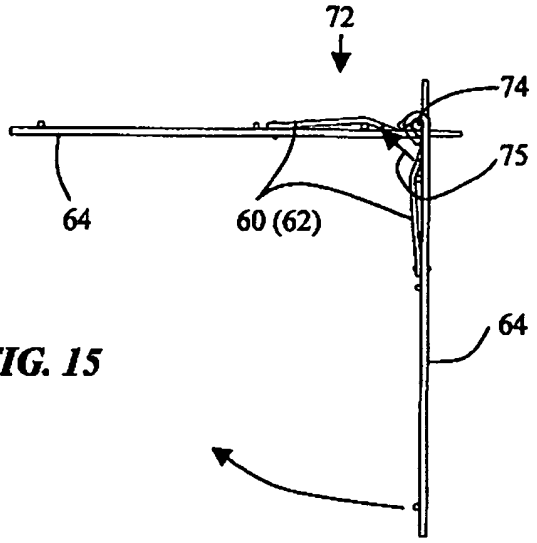
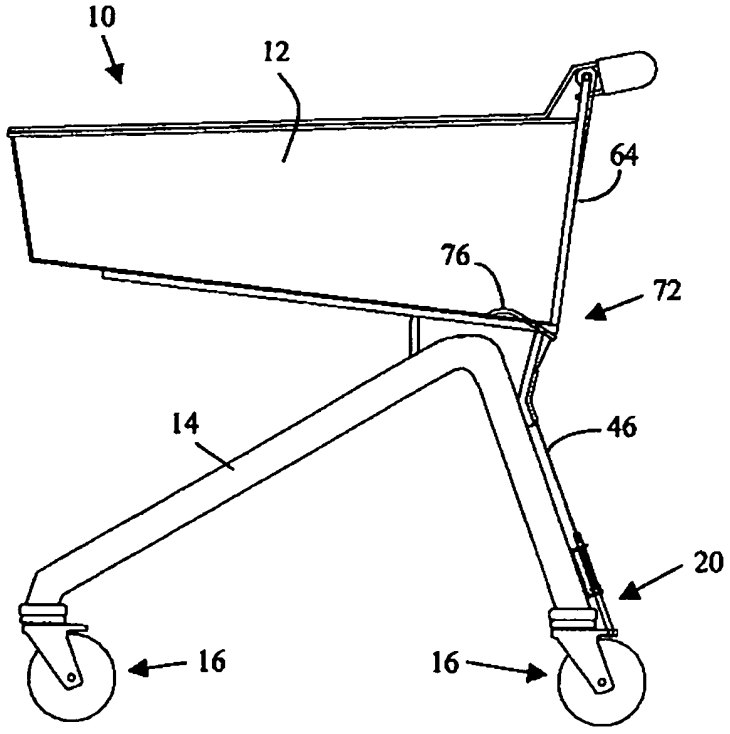


FIG. 15

FIG. 16



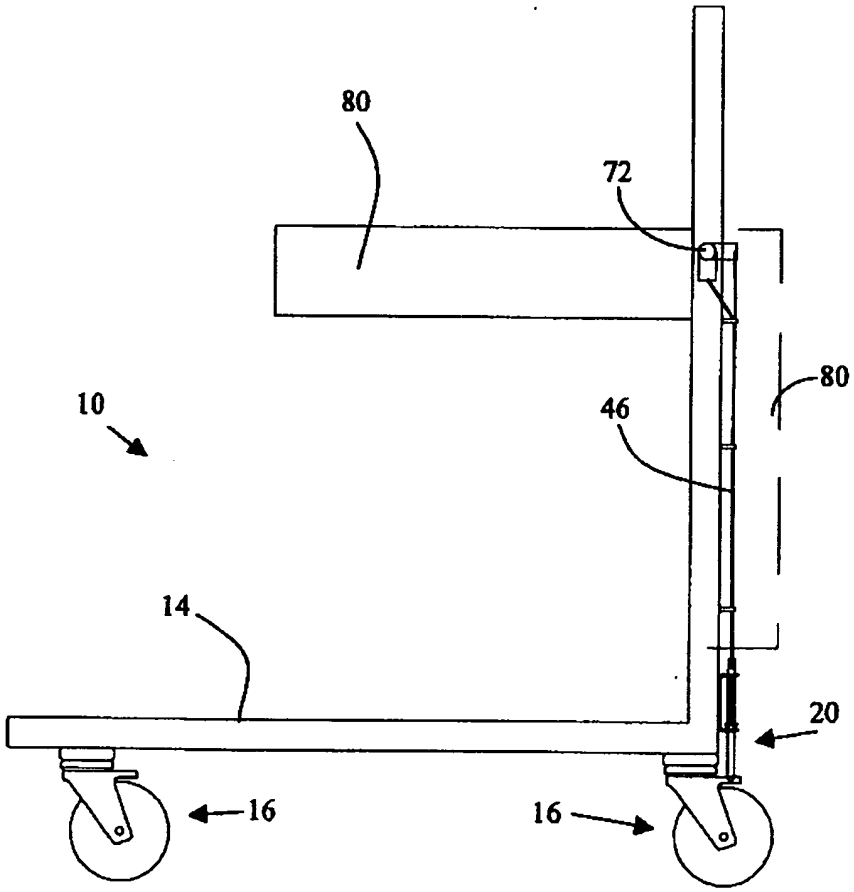


FIG. 17

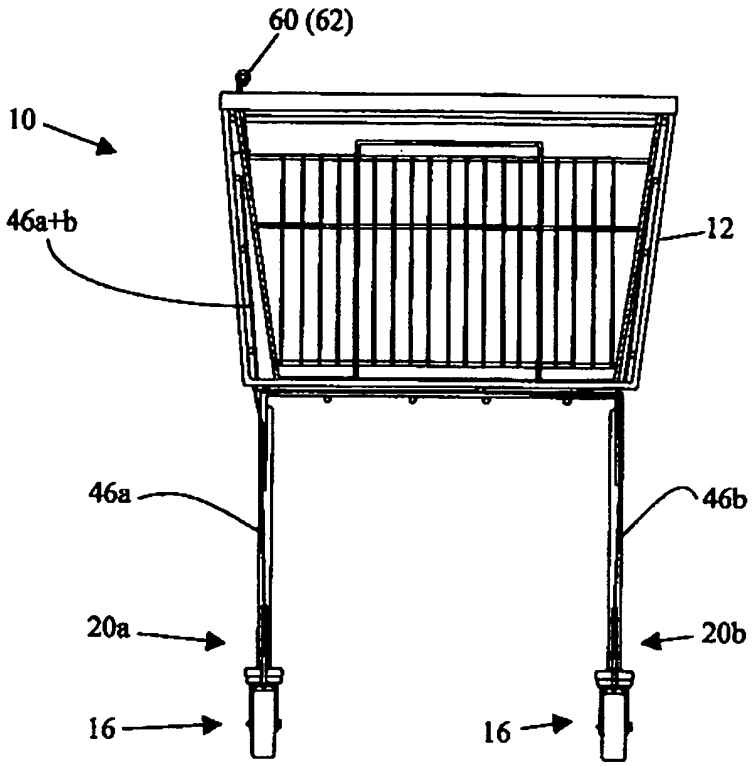
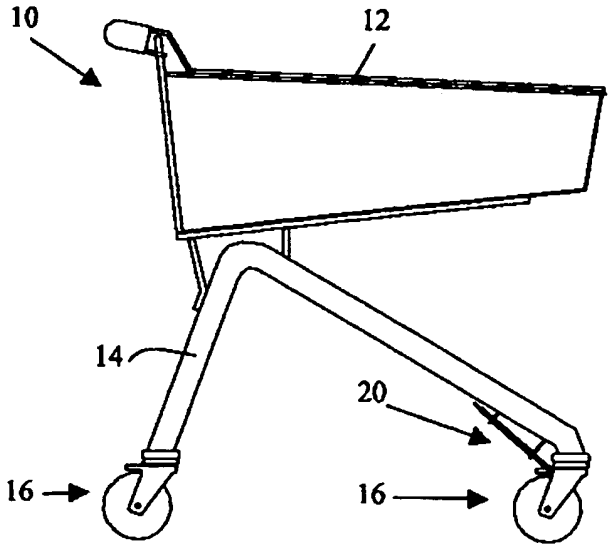


FIG. 18

FIG. 19



IMPROVMENTS RELATING TO CASTOR SWIVEL LOCKS

The present invention relates to a swivel lock for a castor. The invention may be especially suitable for use on a castored trolley, but the invention is not limited exclusively to this. The term "trolley" as used herein includes, but is not limited to, shopping trolleys, luggage trolleys, roll-cages, hospital trolleys, castored carriages, and the like.

Broadly speaking, the invention provides a releasable swivel lock for a castor. When activated, the swivel lock may lock (or trap) the castor in at least one predetermined swivel direction, for example, a fore-aft direction. In such a locked condition, the castor may help stable steering of a trolley, and cure so-called "wandering" or "unsteerable" trolley problems. When the swivel lock is released, the castor may swivel substantially freely to adapt to a direction of movement, and allow the trolley to be generally more manoeuvrable.

In one preferred form, the invention comprises means for automatically releasing the swivel lock when a trolley is in a non-operative condition. Automatically releasing the swivel lock may permit a trolley to be moved more freely when not in normal use, for example, for parking or manoeuvring, either individually, or collectively with other trolleys.

The automatic release means may be operable to reactivate the swivel lock when the non-operative condition is no longer present.

The non-operative condition may be coupling of the trolley with one or more other trolleys. The term "coupling" may include any form of interlocking or loose engagement between trolleys, such as nesting or stacking collectively. The automatic release means may be responsive to such coupling of the trolley. For example, the automatic release means may comprise a portion of the trolley that is displaced upon coupling of the trolley with another trolley.

Additionally or alternatively, the non-operative condition may be displacement of a carrier portion of the trolley. The carrier portion may, for example, be a shelf. The

automatic release means may be responsive to displacement of the carrier portion from a deployed position to a stowed position.

Additionally or alternatively, the non-operative condition may be a change in configuration of the trolley. For example, the trolley may be configurable between a first configuration and a second configuration. The first configuration may be a configuration adopted when the trolley is not coupled with another trolley or alternatively is not couplable with another trolley. The second configuration may be a configuration adopted when the trolley is coupled with another trolley or alternatively is couplable with another trolley.

The swivel lock may be of a latching type that automatically traps the castor in at least one predetermined swivel direction when the swivel lock is activated.

In another preferred form, the swivel lock may comprise a latch surface on a swivellable part of a castor, and a plunger supported above the latch surface. The plunger may be slidable along a sliding axis that is offset from a swivel axis of the castor. The plunger may be resiliently biased at least partly downwardly towards the latch surface. The plunger may be configured for latching engagement with the latch surface when the swivellable part of the castor is in a predetermined swivel direction. The latch surface may comprise at least one ramp surface adjacent to a latch keep. The latch keep may comprise a clearance, such as a recess or aperture.

In another preferred form, the swivel lock may be controllable by a manually operable actuator. The actuator and/or the swivel lock may optionally be configured such that the swivel lock may be settable stably to each of an activated condition or a released condition. In one form, the swivel lock may be biased normally to one condition, and the actuator may be settable stably in the other condition. For example, the swivel lock may be biased to its activated condition, and the actuator may be settable stably in the released condition. The combination may therefore permit the swivel lock to be set stably in each state.

Non-limiting embodiments of the invention are now described, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a schematic side view of a trolley including a swivel lock;

Fig. 2 is a schematic rear view of the trolley of Fig. 1;

Fig. 3 is an enlarged schematic view of a portion of Fig. 1 showing the castor lock in more detail;

Fig. 4 is a view similar to Fig. 3 but showing a possible modification of a detail of the swivel lock;

Fig. 5 is a view similar to Fig. 4, but showing a possible further modification of a detail of the swivel lock;

Fig. 6 is an enlarged schematic view of a portion of Fig. 2 showing the castor lock in more detail;

Fig. 7 is a schematic cross-section along the line VII-VII of Figs. 3 and 6;

Fig. 8 is a view similar to Fig. 7 but showing a possible modification of a detail of the swivel lock;

Fig. 9 is a partial schematic rear view showing a possible modification of detail of the latch surface of the castor lock;

Fig. 10 is a partial schematic side view of the castor lock of Fig. 9;

Fig. 11 is an enlarged schematic view of a portion of Fig. 2 showing an actuator in more detail;

Figs. 12 and 13 are partial schematic views showing a manually operable lever of the actuator of Fig. 11 in two different stable positions;

Fig. 14 is a partial schematic plan view of the actuator depicted in Fig. 13;

Fig. 15 is a schematic representation of the actuator of Fig. 11 in two different positions as an automatic actuator;

Fig. 16 is a schematic side view of a trolley having an alternative configuration of automatic actuator;

Fig. 17 is a schematic side view of a trolley having a further alternative configuration of automatic actuator;

Fig. 18 is a schematic rear view of a trolley having multiple swivel locks; and

Fig. 19 is a schematic side view of a trolley having a swivel lock on a forward castor.

Referring to Figs. 1 and 2, a trolley 10 is shown in the form of a shopping trolley. The principles of this invention may be applied to any trolley, for example, a baggage trolley, a roll-cage, a hospital trolley, a castored carriage, and the like.

The trolley 10 may typically comprise an open-topped metal cage 12 mounted on a frame or chassis 14. The chassis 14 may be supported on swivellable castors 16 typically attached to extremities of the chassis 14. The trolley 12 may also include a handle 18 at the rear of the cage 12 by which the trolley may be pushed or otherwise guided.

At least one of the castors 16 may be provided with a swivel lock 20 for selectively locking the castor 16 in at least one predetermined swivel direction. For example, the predetermined direction may be the fore-aft (front-rear) direction of the trolley 10. The swivel lock 20 may be in the form of a latch that, when activated, may trap the castor 16 in the predetermined swivel direction as the castor swivels. In such a locked condition, the castor 16 may help stable steering of a trolley, and cure so-called "wandering" or "unsteerable" trolley problems. When released, the swivel lock 20 may permit the castor 16 to swivel substantially freely out of the predetermined swivel direction. When freely swivellable, the castor 16 may adapt to a direction of movement of the trolley 10, and allow the trolley 10 to be generally more manoeuvrable, although less stable in terms of steering. In the present embodiment,

the swivel lock 20 may be implemented for a single rear castor. However, as will be apparent from later description, other configurations of one or more swivel locks 20 are possible.

Referring to Figs. 3-7, each castor 16 may generally comprise a castor wheel 22, a wheel support 24, and a swivelling joint 26 coupling the wheel support 24 to the chassis 14. The swivel lock 20 may generally comprise a latch surface 28 and a movable plunger 30 engageable with the latch surface 28.

The plunger 30 may be supported above the latch surface 28, for sliding movement along a sliding axis 32 extending at least partly downwardly towards the latch surface 28. The sliding axis 32 may be offset radially from the swivel axis 34, at least in a plane of the latch surface 28. The plunger 30 may be supported directly or indirectly by the chassis 14 and/or by the swivelling joint 26. For example, the plunger 30 may be slidable in one or more supports 40. In the implementation illustrated in Figs. 3 and 4, the supports 40 may be end walls of a bifurcated frame 36. The frame 36 may be generally U-shaped. In an alternative implementation illustrated in Fig. 5, the supports 40 may be individual lugs mounted on, or extending from, the chassis 40. The plunger 30 may be longer than the distance between the supports 40, and may slide in apertures 38 in the supports 40. The tip of the plunger 30 may be tapered or rounded to facilitate engagement with the latch surface 28.

A spring 42 may urge the plunger 30 in a direction at least partly downwardly, towards the latch surface 28. For example, the spring 42 may be a compression spring. One end of the spring 42 may bear on an upper support 40, and the other end of the spring 42 may bear on a washer or flange 44 projecting from the plunger 30. The washer or flange 44 may also limit the extent to which the plunger 30 can move downwardly relative to the supports 40 and/or the frame 36. A cable 46 may be attached to an end of the plunger 30 remote from the latch surface 28, for selectively retracting the plunger 30 away from engagement with the latch surface 28, as described later.

The latch surface 28 may be attached to, or integral with, a swivellable portion of the castor 16. For example, the latch surface 28 may be attached to, or integral with, the

swivelling joint 26 and/or the wheel support 24. Fig. 3 illustrates an implementation in which the latch surface 28 is a separate part attached to a yoke portion 24a of the wheel support 24, for example, by welding or riveting. Fig. 4 illustrates an alternative implementation in which the latch surface 28 is integrated as a lateral extension of a yoke portion 24a of the wheel support 24.

The latch surface 28 may include a keep portion, for example, in the form of a clearance 50, for engagement by the plunger 30. The clearance 50 may be a recess, or a notch, or an aperture for receiving the end of the plunger 30. In the implementation illustrated thus far, the clearance 50 may be an aperture. A ramp surface 52 may be provided adjacent to the clearance 50. Preferably, first and second ramp surfaces 52 are provided, one on each side of the clearance 50. The or each ramp surface 52 may depend from a yoke portion 54 of the latch surface 28 at which the clearance 50 is located. The or each ramp surface 52 may function to lift the plunger 30 in a direction against the spring bias, as the castor approaches the predetermined swivel position, whereupon the plunger 30 is urged into the clearance 50 to trap the castor 16 at the predetermined swivel position.

Referring to Figs. 3 to 7, the plunger 30 may be positioned adjacent to the chassis 14 in a fore-aft direction of the trolley 10. The latch surface 28 may similarly be aligned to be engaged by the plunger 30 when the castor 16 is in the fore-aft position. With such a configuration, the latch surface 28 may project substantially only in the direction of the castor wheel 22, and generally to a lesser extent than the castor wheel 22. The periphery of the latch surface 28 thus does not project substantially outside the periphery of the castor 16. The castor wheel 22 may thereby protect the latch surface 28 from damage that might otherwise be caused by rough treatment of the trolley, or collisions with other trolleys. Also, the risk of a projecting edge of the latch surface 28 causing accidental injury to a person using the trolley 10 is reduced.

In an alternative form illustrated in Fig. 8, the latch surface 28 may be provided by a disc 56 having the clearance (e.g., an aperture) 50 at a position corresponding to the predetermined swivel position to be locked. The continuous circumferential surface of the disc 56 lifts the plunger 30 at all other angles of swivel, until the castor reaches the predetermined lock position, whereupon the plunger 30 drops into the clearance

50. Such a configuration avoids the need for ramp surfaces 52 to lift the plunger 30 as the castor approaches the predetermined lock position. However, the projecting circumferential edge of the disc 56 might potentially be more vulnerable to damage, depending on the nature of the trolley 10.

In a yet further form illustrated in Figs. 9 and 10, the clearance 50 may be implemented as a trough or channel 58 formed between two ridges shaped to define the ramp surfaces 52 on either side of the clearance 50. Compared to the previous implementations in which the clearance 50 may be an aperture, a channel 58 may be formed without having to stamp, drill or cut an aperture through the latch surface 28. For example, the profile including the channel 58 and the ramp surfaces 52 may be formed by any suitable shaping process, such as stamping or extrusion. As best seen in Fig. 9, this implementation may share the advantages of Fig. 7, namely that the latch surface 28 does not project substantially from the castor 16 outside the periphery or footprint of the castor wheel 22 and the wheel support 24.

A further advantage of the implementations illustrated is that the overall height of the castor 16 including the swivel lock 20 need not be increased significantly (if at all) compared to a castor without a swivel lock 20. This makes the design versatile in being able to be fitted to any number of the castors, as desired, without introducing compatibility problems by mixing castors with the swivel lock, and conventional castors without the swivel lock, on the same trolley 10.

Referring to Figs. 2 and 9, the trolley may comprise a manually operable remote actuator 60 for releasing the swivel lock 20. The actuator 60 may pull the cable 46 to retract the plunger 30 from engagement with the latch surface 28. The actuator 60 may be positioned close to the handle 18 for ease of use. The actuator may, for example, comprise a pivoting lever 62 to which the cable 46 is attached. The lever 62 may be pivotally attached to a rear wall 64 of the trolley 10 at a pivot axis 66. The cable 46 may be attached to the lever 62 at a position 68 intermediate the ends of the lever 62. When the lever 62 is moved (e.g., to the right in Figs. 2 and 8), the plunger 30 lifts and releases the swivel lock 20. When the lever 62 is released, the spring 42 at the swivel lock 20 may urge the plunger 30 to re-engage the latch surface 28 when the castor is next in the predetermined swivel lock position. The spring 42 acting via

the cable 46 may also return lever 62 back to its normal position (e.g., back to the left in Figs. 2 and 8). If desired an additional spring (not shown) may be provided at the actuator 60 to bias the lever 62 to its normal position. The cable 46 may be routed along one or more conduits or guides 70 for guiding the cable between the swivel lock 20 and the actuator 60.

With the above configuration, the normal condition of the swivel lock 20 may be its activated state to trap the castor 16 in the predetermined swivel lock direction, e.g., a fore-aft direction. In this normal condition, the swivel lock 26 may stabilise the trolley steering. Should the person using the trolley 10 require more manoeuvrability (for example, sideways movement or free movement in any direction), the swivel lock 20 may be released temporarily by operating the actuator 60. Thereafter, the swivel lock 20 may reactivate automatically to trap the castor 16 when the castor 16 next reaches the predetermined swivel lock direction. For example, pushing the trolley 10 generally forwards may align the castors 16 generally in the fore-aft direction, whereupon the swivel lock 20 may retrap the respective castor 16 in that predetermined direction.

In the implementation illustrated in Fig. 8, the lever 62 may be arranged to return automatically to its normal position once the user has released pressure on the lever 62. In an alternative configuration illustrated in Figs. 9 to 11, the actuator 60 may further include a device 69 for holding the lever 62 in its displaced position, to keep the swivel lock 20 in its released condition. For example, the device may be a catch, for example in the form of a barb or ratchet projection 69 in the path of the lever 62. As best seen in Fig. 14, one side of the projection 69 may have a ramped surface to ease the lever 62 over the projection 69 when the lever 62 is operated. The other side of the projection 69 may have a more obstructive surface, such as an abrupt or recessed surface to obstruct return movement of the lever 62. In order to release the lever 62 (and hence reactivate the swivel lock 20), the user may have to guide the lever 62 past the projection 69.

The above arrangement may be useful for situations in which the user may wish to keep the swivel lock disengaged for a long period of time, for example, to render a trolley 10 more manoeuvrable in a busy supermarket.

If desired, the projection 69 may be positioned near an extreme end of the range of movement of the lever 62. In such a case, the user may momentarily release the swivel lock 20 by operating the lever just short of the projection 69. When released, the lever 62 may return automatically to its normal position. Should the user wish to release swivel lock 20 for an extended period, the user can move the lever 62 further to the right to latch the lever 62 in its displaced position.

Additionally or alternatively to a manual actuator 60, the trolley 10 may comprise an automatic actuator 72 arranged to release the swivel lock 20 when the trolley 10 is in a predetermined non-operative condition. Releasing the swivel lock 20 when the trolley is not in normal use may be advantageous to render the trolley 10 more manoeuvrable, for example, for parking, or for stacking with other trolleys. The predetermined non-operative condition may be coupling (e.g., stacking or nesting) of the trolley with another trolley. The automatic actuator 72 may be independent of the manually operable actuator 60 (if provided), or it may be implemented at least partly by the manually operable actuator 60. The automatic actuator 72 may be responsive to coupling of another trolley to the rear, or responsive to coupling of another trolley to the front, or responsive to either.

Referring to Figs. 9 and 15, the rear wall 64 of the trolley 10 may be movable to permit a front portion of another trolley 10 to be partly inserted or nested into the rear of the current trolley 10. For example, the rear wall 64 may hinge upwardly about a hinge axis 74 when the other trolley is advanced into the current trolley 10 from the rear. The automatic actuator 72 may be responsive to movement of the rear wall 64 to release the swivel lock 20. In the embodiment of Figs. 9 and 15, the automatic actuator 72 may be implemented by a specific configuration of the manually operable actuator relative 60 relative to the rear wall 64. Referring to Fig. 9, displacement of the rear wall 64 from a vertical (or almost vertical position) to a horizontal (or almost horizontal) position also displaces the lever 62 mounted on the rear wall 64. As represented by the arrow 75, such displacement moves the cable 46 by the point of attachment to the lever 62. The movement of the cable 46 retracts the plunger 30 and thereby releases the swivel lock 20. When the other trolley is uncoupled from the

current trolley 10, the rear wall 64 drops back to its almost vertical position, thereby releasing the tension on the cable 46, and reactivating the swivel lock 20.

In a slightly modified embodiment (not shown), the manual actuator 60 might not be directly attached to the rear wall 64, but might be acted on by displacement of the rear wall 64 out of its normal, almost vertical position.

In an alternative embodiment illustrated in Fig. 16, the automatic actuator 72 may comprise a separate lever 76 that is displaced by movement of the rear wall 64 out of its normal position and/or by close contact with another trolley partly nesting with the trolley 10. An alternative or additional actuator 72 may be provided, for example, near the front of the trolley, and responsive to the current trolley 10 being coupled at the front to another trolley.

In each of the above cases, when the trolley 10 is uncoupled from the adjacent trolley, the automatic actuator 74 may release to reactivate the swivel lock 20.

In a yet further embodiment illustrated in Fig. 17, the trolley 10 may comprise a shelf 80 or other carrier, that is movable between a first (e.g., deployed) position as shown in Fig. 17, and a second (e.g., stowed) position as shown in phantom in Fig. 17. The predetermined non-operative condition may be placement of the shelf in the second position. Moving the shelf 80 to the second position may permit the trolley 10 to be coupled (e.g., nested or stacked) with another trolley in front of the current trolley 10. The chassis 14 may be tapered to permit such coupling. The automatic actuator 72 for detecting the non-operative condition may comprise a lever that is displaced to pull the cable 46 when the shelf 80 is moved from the first position to the second position. When the shelf is subsequently moved back to its first position, the automatic actuator 72 may release to reactivate the swivel lock 20. Although not illustrated in Fig. 17, the trolley 10 may further include a manually operable actuator 60 as described previously.

The above embodiments illustrate a swivel lock 20 applied to a single rear castor 16 of the trolley. If desired, multiple swivel locks 20 may be used either for rear castors or front castors, or a combination of both. For example, Fig. 18 illustrates multiple

swivel locks 20a, 20b used for the rear castors 16. Each swivel lock 20a, 20b is activated by a respective cable 46a, 46b joined to a common actuator 60, for example, a single actuator lever 62. Alternatively, a linking cable 46 may bridge the two swivel locks 20a, 20b, and the linking cable may be acted on by an actuator cable coupled to the linking cable by a suitable bridge or yoke.

For the sake of completeness, Fig. 19 illustrates a further embodiment of trolley 10 having a swivel lock 20 for a front castor 16. The plunger 30 may be supported at a shallower angle at the front, owing to the geometry of the chassis 14. However, the design of the plunger 30 and the latch surface 28 described above may permit a wide range of operating angles and inclinations to be accommodated.

Although the above embodiments illustrate a swivel lock 20 having a single predetermined swivel direction in which a castor 16 is trapped (for example, a fore-aft direction), it will be appreciated that plural predetermined swivel directions may be implemented, for example, by providing multiple plural clearances 50 in the latch surface 28 at different angular positions with respect to each other.

The present invention, particularly as illustrated in the preferred embodiments, can provide a versatile swivel lock and/or actuator arrangement for a castored trolley. The swivel lock may be relatively simple and cheap to implement, yet robust and versatile to fit many different designs of trolley. Additionally, the swivel lock may have a relatively low part count, and be simple to maintain. The swivel lock and/or the actuator may be made of any suitable material, such as metal (e.g. stainless steel), plastics or fibre.

While features believed to be of importance are defined in the appended claims, protection is claimed for any novel feature or idea described herein and/or illustrated in the drawings whether or not emphasis has been placed thereon.

CLAIMS

1. A trolley comprising:

at least one castor;

a releasable locking device for locking a swivel direction of the castor; and

means for automatically releasing the locking device when the trolley is in a predetermined non-operative condition.

2. A trolley according to claim 1, wherein automatic release means is responsive to a change in configuration of the trolley.

3. A trolley according to claim 2, wherein the automatic release means is responsive to a change from a first configuration adopted when the trolley is not coupled to another trolley, to a second configuration adopted when the trolley is coupled to another trolley.

4. A trolley according to claim 2, wherein the automatic release means is responsive to a change from a first configuration adopted when the trolley is not couplable to another trolley, to a second trolley adopted when the trolley is couplable to another trolley.

5. A trolley according to any preceding claim, wherein the predetermined non-operative condition is coupling of the trolley to another trolley, and the automatic release means is responsive to coupling of the trolley to another trolley.

6. A trolley according to claim 5, wherein the automatic release means comprises means responsive to nested stacking of the trolley with another trolley.

7. A trolley according to claim 5 or 6, wherein the automatic release means comprises a lever that is displaceable upon coupling of the trolley with another trolley.

8. A trolley according to claim 5, 6 or 7, wherein the automatic release means is mounted on, or acted on, by a movable wall portion of the trolley that is displaceable by coupling with another trolley.

9. A trolley according to claim 1, 2, 3 or 4, wherein the trolley further comprises a movable carrier portion, the carrier portion being movable between first and second positions, and wherein the predetermined non-operative condition is placement of the movable carrier portion in the second position.

10. A trolley according to claim 9, wherein the first position is a deployed position of the carrier portion, and the second position is a stowed position of the carrier portion.

11. A trolley according to any preceding claim, further comprising a manually operable actuator for manually releasing the locking device.

12. A trolley according to claim 11, wherein the manually operable actuator is configured to be settable in a displaced position.

13. A trolley according to claim 11 or 12, wherein the automatic release means and the manually operable actuator comprise means in common with each other.

14. A trolley according to any preceding claim, wherein the automatic release means is coupled to the releasable locking device by a flexible cable.

15. A trolley according to any preceding claim, wherein the releasable locking device is biased to a normally activated or locked condition.

16. A trolley according to any preceding claim, wherein the automatic release means is configured to reactivate the locking means after the predetermined non-operative condition has passed.

17. Apparatus comprising:

a swivellable castor part having a swivel axis;

a latch surface carried by the swivellable castor part;

a plunger slidably supported above the latch surface for sliding movement along a sliding axis offset from the swivel axis, the plunger being resiliently biased at least partly in a downward direction for latching engagement with the latch surface when the swivellable castor part is in a predetermined swivel direction, thereby to latch the swivellable castor part in said predetermined swivel direction.

18. Apparatus according to claim 17, wherein the sliding axis of the plunger is inclined at an angle with respect to the swivel axis.

19. Apparatus according to claim 17 or 18, wherein the sliding axis of the plunger is offset from the swivel axis at least in a plane of the latch surface.

20. Apparatus according to claim 17, 18 or 19, wherein the latch surface comprises a keep portion for engagement by the plunger.

21. Apparatus according to claim 20, wherein the keep portion comprises a clearance for receiving an end of the plunger.

22. Apparatus according to claim 21, wherein the clearance is an aperture in the latch surface.

23. Apparatus according to claim 21, wherein the clearance is a channel in the latch surface.

24. Apparatus according to any of claims 20 to 23, wherein the latch surface further comprises a ramp surface to one side of the keep portion.

25. Apparatus according to claim 24, wherein the latch surface comprises first and second ramp surfaces one to each side of the keep portion.

26. Apparatus according to claim 17, or any claim dependent thereon, wherein the periphery of the latch surface does not extend substantially outside a periphery of the swivellable castor part.

27. Apparatus according to claim 17, or any claim dependent thereon, wherein the swivellable castor part comprises a rotatable wheel and a swivellable wheel support.

28. Apparatus according to claim 17, or any claim dependent thereon, further comprising an actuator cable for retracting the plunger.

29. Apparatus according to claim 17, or any claim dependent thereon, further comprising an actuator remote from the castor swivellable part for selectively controlling an activated or released condition of the plunger.

30. A trolley according to any of claims 1 to 16 and including apparatus as defined in any of claims 17 to 29.

31. A trolley comprising:

at least one castor;

a releasable locking device for locking a swivel direction of the castor;

a remote actuator coupled to the releasable locking device by a flexible cable;

wherein the remote actuator and the releasable locking device are configured such that the releasable locking device can be configured stably in an activated condition and a released condition.

32. A trolley according to claim 31, wherein the remote actuator is a manually operable actuator positioned close to a handle of the trolley.

33. A trolley or a castor swivel lock or an actuator for a castor swivel lock, being substantially as hereinbefore described with reference to any of the accompanying drawings.

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Application No: GB 0303238.0 **Examiner:** Alastair Kelly
Claims searched: 1-30 **Date of search:** 6 May 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X, Y	X:1-8 Y:11, 12, 14,30	GB2234945	ABBOTT see abstract and figure 1
X, Y	X:1-8 Y:11, 12, 14, 30	GB2284985	SMITH see abstract and figure 1 and 11
X, Y	X:17-27 Y:28, 29, 30	WO94/10000	DIBBEN see figures 2, 3 and 5 and lines 8 to 11, page 10
X, Y	X:31, 32 Y:11, 12, 14, 28, 29	GB2327916	DIAS see abstract and figure 4

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[V]:

A4L, B7B

Worldwide search of patent documents classified in the following areas of the IPC[7]:

B60B, B62B

The following online and other databases have been used in the preparation of this search report :

On-line: EPODOC, WPI, JAPIO